What is claimed is:

1)   A method for controlling the momentum compaction in a beam of charged particles, comprising the steps of:

providing a beamline, said beamline including a centerline and a radius;

5   providing a compaction-managed mirror bend achromat including a mirror bend achromat having an exterior dipole, a first bend magnet, and a second bend magnet;

selecting a high momentum reference orbit to set the overall geometry of said compaction-managed mirror bend achromat, said geometry including a maximum

10   radius of interest and a drift length from said first bend magnet to said beamline centerline;

providing an extended active magnetic region at said exterior dipole; and

introducing a central reverse bending region at the center of said compaction-managed mirror bend achromat.

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2)   The method of claim 1 wherein said extended active magnetic region and said central reverse bending region impose a chicane on said low momentum component, said chicane including an additional bend angle and an adjacent drift.

20   3)   The method of claim 2 wherein said additional bend angle of said chicane lengthens the orbit of said low momentum component.

4)   The method of claim 3 wherein proper selection of said additional bend angle and the length of said adjacent drift allows the length of the low momentum orbit to be matched to the length said high momentum reference orbit.

5   5)   The method of claim 4 wherein said central reverse bending region enables said low momentum orbit to match the angle of said high momentum reference orbit.

6)   The method of claim 5 wherein said beam is dispersion-suppressed to all

10   orders.

7)   The method of claim 6 wherein said beamline radius is fixed to that defined by said high momentum reference orbit.

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